Sub CS B4

20. (Amended) A method of improving the contrast ratio of a liquid crystal display device according to claim ~~19~~ 18, wherein the liquid crystal layer is cooled below a smectic phase temperature.

21. (Amended) A method of improving the contrast ratio of a liquid crystal display device according to claim 20, wherein the liquid crystal layer is subsequently heated above the smectic phase temperature.

Please **DELETE** claims 11 and 19.

REMARKS

Claims 1-21 were pending in the subject application. Claims 1, 3-5, 10, 12-18, and 20-21 are amended and claims 11 and 19 are deleted. Therefore, claims 1-10, 12-18, and 20-21 are actively being prosecuted. A minor amendment is also made to the Specification. Attached hereto is a marked-up version of the changes made to the specification and to the claims. That attachment is captioned **"Version with markings to show changes made."** Reexamination and reconsideration of the subject application, as amended, are respectfully requested.

The USPTO objected to the disclosure because on page 12, in lines 5 and 7, "Figure 5" should be --Figure 6--. In response, page 12, lines 5 and 7 are amended to change "Figure 5" to --Figure 6--.

The USPTO objected to the claims because in claims 1, 4, 5, 12-13, 16-17, and 20-21, "smetic" should be --smectic--. In response, claims 1, 4, 5, 12-13, 16-17, and 20-21 are amended to change "smetic" to --smectic--.

Additionally, the USPTO rejected claims 10-13, and 18-21 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding the 35 U.S.C. 112, second paragraph, rejections of claims 10 and 18, the Examiner found it unclear as what "thermally increasing the alignment of the liquid crystal molecules" means. In response, the unclear language is amended to --cooling the liquid crystal layer to increase the alignment of the liquid crystal molecules--.

Regarding the 35 U.S.C. 112, second paragraph, rejections of claims 11 and 19, the Examiner found a lack of antecedent basis for the limitation of "the temperature." Claims 11 and 19 are deleted in view of the amendments made to claims 10 and 18. Thus, the 35 U.S.C. 112, second paragraph, rejections of claims 11 and 19 are rendered moot.

Regarding the 35 U.S.C. 112, second paragraph, rejections of claims 12-13 and 20-21, the Examiner found those claims indefinite because the reduced temperature was beyond the smectic phase temperature; which makes the liquid crystal layer not ferroelectric; and claims 10 and 18 recite a ferroelectric liquid crystal. Additionally, with regard to claims 13 and 21, the USPTO found the language confusing since an increased temperature happens at the same time as a reduced temperature (reference claims 12 and 20). With all respect to the Examiner, the 35 U.S.C. 112, second paragraph, rejections of claims 12-13 and 20-21 are traversed.

Support for the traversals of the 35 U.S.C. 112, second paragraph, rejections of claims 12-13 and 20-21 is based on patent claim construction. The Examiner's positions are understood as being that once an element (the ferroelectric liquid crystal layer) is called out, that element could not undergo change, and that all actions (temperature changes) must occur simultaneously.

However, that is not the law of patents. If it were, there would be very few chemical or biotechnology patents. Furthermore, almost all method patents are directed to changing at least one element.

Turning now to the subject application, specifically claims 10 and 18. Those claims relate to ferroelectric liquid crystal layers interposed between first and second substrates. Modifying the ferroelectric liquid crystal layer to temporarily become non-ferroelectric, see claims 12-13 and 20-21, does not render the claims unclear or confusing. The Examiner is asked to note that the claims do not require or even suggest that a ferroelectric state exists at all times. Therefore, claims 12 and 20 are allowable.

Now, regarding claims 13 and 21, those claims, when taken with the limitations of their base claims, do not require or suggest simultaneous thermal changes. Therefore, claims 13 and 21 are allowable.

The USPTO also rejected claims 1-2, 4-6, 10-14, and 16-21 under 35 USC 102(b) as being anticipated by Hanyu et al. (US 5,200,848). In response, Applicants amended the independent claims, claims 1, 10, and 18, to recite a specific limitation not in Hanyu et al. That limitation relates to a monostable alignment of the ferroelectric liquid crystal layer. Hanyu et al. only teaches a bi-stable ferroelectric liquid crystal layer. Thus, Applicant's assert a patentable distinction between the subject invention and Hanyu et al.

Finally, claims 1, 3, 10, 12-15, 18, and 20-21 are amended for clarity and to better prepare for allowance.

In view of the above, each of the presently pending claims in this application is

believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

Dated: August 16, 2002

Respectfully submitted,

By Reg. No. 46,463 for

John M. Kelly
Registration No.: 33,920
MCKENNA LONG & ALDRIDGE LLP
1900 K Street, N.W.
Washington, DC 20006
(202) 496-7500
Attorneys for Applicant

Version With Markings to Show Changes Made

In the Specification, on page 12, paragraphs 2 and 3.

Now, with reference to Figure [5] 6, an early alignment state of the ferroelectric LC will be explained.

Figure [5] 6 is a cross-sectional view illustrating the alignment the ferroelectric LC. As shown, a plurality of LC molecules 111 are aligned to have an ideal alignment order. At the room temperature, the LC molecules 111 have a thermal motion of themselves and an interaction with each other. According to their thermal motion and interaction, each of the LC molecules takes a relative position in a layer.

In the Claims:

1. (Amended) A method of fabricating a liquid crystal display device, comprising:

forming a liquid crystal panel including first and second substrates;

forming a ferroelectric liquid crystal layer between the first and second substrates of the liquid crystal panel; and

cooling the liquid crystal panel to a temperature of a [smetic] smectic phase so as to produce monostable alignment of the ferroelectric liquid crystal.

3. (Amended) The method of claim 1, wherein the ferroelectric liquid crystal layer includes an anti-ferroelectric liquid crystal layer.

4. (Amended) The method of claim 1, wherein the [smetic] smectic phase includes a chiral [smetic] smectic C.

5. (Amended) The method of claim 1, wherein the [smetic] smectic phase includes a chiral [smetic] smectic C_A.

10. (Amended) A method of fabricating a liquid crystal display device, comprising:

forming a liquid crystal panel having a first substrate and a second substrate;

interposing a ferroelectric liquid crystal layer comprised of liquid crystal molecules, between the first substrate and a second substrate; and

[thermally increasing the alignment of the liquid crystal molecules] cooling the liquid crystal layer to form a monostable the alignment of the liquid crystal molecules.

12. (Amended) A method of fabricating a liquid crystal display device according to claim 11, wherein the liquid crystal layer is cooled [temperature is reduced] below a [smetic] smectic phase temperature.

13. (Amended) A method of fabricating a liquid crystal display device according to claim 12, wherein the liquid crystal layer is subsequently heated [temperature is increased] above the [smetic] smectic phase temperature.

14. (Amended) A method of fabricating a liquid crystal display device according to claim 12, wherein the [temperature is reduced to] liquid crystal layer is cooled to about -20°C.

15. (Amended) A method of fabricating a liquid crystal display device according to claim 10, wherein the ferroelectric liquid crystal layer includes an anti-ferroelectric liquid crystal layer.

16. (Amended) A method of fabricating a liquid crystal display device according to claim 10, wherein the [smetic] smectic phase includes a chiral [smetic] smectic C.

17. (Amended) A method of fabricating a liquid crystal display device according to claim 10, wherein the [smetic] smectic phase includes a chiral [smetic] smectic C_A.

18. (Amended) A method of improving the contrast ratio of a liquid crystal display device, comprising:

forming a liquid crystal panel having a first substrate, a second substrate, and an interposed ferroelectric liquid crystal layer that is comprised of liquid crystal molecules;

[thermally increasing the alignment of the liquid crystal molecules] cooling the liquid crystal layer to form a monostable alignment of the liquid crystal molecules; and

passing light though said liquid crystal panel.

20. (Amended) A method of improving the contrast ratio of a liquid crystal display device according to claim 19, wherein the liquid crystal layer is cooled [temperature is reduced] below a [smetic] smectic phase temperature.

21. (Amended) A method of improving the contrast ratio of a liquid crystal display device according to claim 20, wherein the liquid crystal layer is subsequently heated [temperature is increased] above the [smetic] smectic phase temperature.